

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated hereafter.

Claims:

1-7. (Cancelled)

8. (Currently Amended) A method of protecting a plant or a part of said plant against insect or nematode infestation by one or more insects or nematodes having digestive cysteine proteases, comprising the steps of:

- (a) culturing cells or tissue from the plant;
- (b) inserting into the genome of the cells or tissue a sequence coding for a cysteine protease inhibitor selected from the group of proteins containing at least one type I repeated thyroglobulin domain, with a promoter sequence active in the plant to cause expression of said protein at levels which provide an insect or nematode controlling amount of said protein; and
- (c) regenerating resistant whole plants from the cells or tissue.

9. (Cancelled)

10. (Currently Amended) The method according to claim 8, which comprises the further step of (d) sexually or clonally reproducing the whole plants in such a manner that at least one copy of the sequence coding for the protein containing at least one type I repeated thyroglobulin domain with a promoter sequence active in the plant is present in the cells of the thus formed reproduced plants.

11. (Currently Amended) The method according to claim 10, further comprising the steps of:

- (a) providing a fertile plant prepared by the method of claim 10, which plant is either insect or nematode resistant;
- (b) sexually crossing the plant that is either insect or nematode resistant ~~plant~~ with a plant from an insect or nematode susceptible variety;

- (c) recovering reproductive material from the progeny of the cross; and
- (d) growing resistant plants from the reproductive material.

12. (Currently Amended) The method according to claim 11, which comprises the further steps of repetitively;

(a) backcrossing the resistant plants ~~insect or nematode resistant progeny~~ prepared by the method of claim 11 8 with substantially homozygous plants from an insect or nematode susceptible variety; and

(b) selecting for expression of both insect or nematode resistance and other characteristics of the susceptible variety among the progeny of the backcross, until the desired percentage of the characteristics of the susceptible variety are present in the progeny along with the insect or nematode resistance.

13. (Currently Amended) A transgenic plant ~~or~~ and its sexual progeny which is resistant to attack by one or more insects or nematodes having digestive cysteine proteases, said transgenic plant expressing an insect or nematode controlling amount of a protein containing at least one type I repeated thyroglobulin domain.

14. (Previously Amended) An expression vehicle comprising a promoter effective to promote expression of a downstream coding sequence in plant cells, a DNA coding region coding for the expression in plant cells of a protein comprising at least one type I repeated thyroglobulin domain and a termination sequence effective to terminate transcription or translation of the protein product in plant cells, the expression vehicle being effective to express in plant cells insect controlling amounts of the protein comprising at least one type I repeated thyroglobulin domain.

15 -16. (Cancelled)

17. (Previously Amended) A host cell transformed with the expression vehicle of claim 14.

18. (Previously Amended) The host cell of claim 17, wherein the DNA coding region is controlled by a promoter effective to promote expression of a downstream coding sequence in a plant cell, the DNA coding region coding for the expression in plant cells of a protein comprising at least one type I repeated thyroglobulin domain and a termination sequence effective to terminate transcription or translation of the protein product in plant cells, the expression vehicle being effective to express in plant cells insect controlling amounts of the protein comprising at least one type I repeated thyroglobulin domain to control one or more insects having digestive cysteine proteases.

19-23. (Cancelled)

24. (Currently Added) An expression vehicle comprising a promoter effective to promote expression of a downstream coding sequence in plant cells, a DNA coding region coding for the expression in plant cells of a protein having the amino acid sequence SEQ ID NO: 2 or a ~~functional derivative thereof~~ protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain and a termination sequence effective to terminate transcription or translation of the protein product in plant cells, the express vehicle being effective to express in plant cells insect controlling amounts of the protein.

25-26. (Cancelled)

27. (Previously Added) A transgenic plant and its sexual progeny which is resistant to attack by one or more insects or nematodes having digestive cysteine proteases, said transgenic plant produced from the *in vitro* introduction of the DNA sequence of SEQ ID NO: 1 into a plant cell.

28. (Currently Amended) An expression vehicle comprising a promoter effective to promote expression of a downstream coding sequence in plant cells, a DNA coding region of SEQ ID NO: 1, coding for the expression in plant cells of a ~~substantially pure~~ protein ~~comprising~~, the amino acid sequence of which comprises residues 1-67 of SEQ ID NO: 2 or a ~~functional derivative thereof~~, protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain and a termination sequence effective to terminate transcription or translation of the protein product in plant cells, the expression vehicle being effective to express in plant cells insect controlling amounts of the protein, the amino acid sequence of which comprises residues 1-67 of SEQ ID NO: 2 or a functional derivative thereof.

29. (Currently Amended) An expression vehicle comprising a promoter effective to promote expression of a downstream coding sequence in plant cells, a DNA coding region of SEQ ID NO: 1, coding for the expression in plant cells of a ~~substantially pure~~ protein, the amino acid sequence of which comprises residues 68-199 of SEQ ID NO: 2 or a ~~functional derivative thereof~~, protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain and a termination sequence effective to terminate transcription or translation of the protein product in plant cells, the expression vehicle being effective to express in plant cells insect controlling amounts of the protein, the amino acid sequence of which comprises residues 68-199 of SEQ ID NO: 2 or a functional derivative thereof.

30. (Currently Added) A method of protecting a plant or a part of said plant against insect or nematode infestation by one or more insects or nematodes having digestive cysteine proteases, comprising the steps of:

- (a) culturing cells or tissue from the plant;
- (b) causing the genome of the cells or tissue to produce a ~~substantially pure~~ polypeptide, the amino acid sequence of which comprises SEQ ID NO: 2 or a ~~functional~~

derivative thereof, protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain with a promoter sequence active in the plant to cause expression of said polypeptide at levels which provide an insect or nematode controlling amount of said protein; and

- (c) regenerating resistant whole plants from the cells or tissue.

31. (Currently Added) A method of protecting a plant or a part of said plant against insect or nematode infestation by one or more insects or nematodes having digestive cysteine proteases, comprising the steps of:

- (a) culturing cells or tissue from the plant;

(b) inserting into the genome of the cells or tissue a DNA coding sequence, the nucleic acid sequence of which comprises SEQ ID NO: 1, that encodes a polypeptide, the amino acid sequence of which comprises residues 1-67 of SEQ ID NO: 2 or a functional derivative thereof, protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain with a promoter sequence active in the plant to cause expression of said polypeptide at levels which provide an insect or nematode controlling amount of said protein; and

- (c) regenerating resistant whole plants from the cells or tissue.

32. (Currently Added) A method of protecting a plant or a part of said plant against insect or nematode infestation by one or more insects or nematodes having digestive cysteine proteases, comprising the steps of:

- (a) culturing cells or tissue from the plant;

(b) inserting into the genome of the cells or tissue a DNA coding sequence, the nucleic acid sequence of SEQ ID NO: 1, that encodes a polypeptide, the amino acid sequence of which comprises residues 68-199 of SEQ ID NO: 2 or a functional derivative thereof, protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I

repeated thyroglobulin domain with a promoter sequence active in the plant to cause expression of said polypeptide at levels which provide an insect or nematode controlling amount of said protein; and

- (c) regenerating resistant whole plants from the cells or tissue.

33. (Currently Added) A method of protecting a potato plant or a part of said plant against insect or nematode infestation by one or more insects or nematodes having digestive cysteine proteases, comprising the steps of:

- (a) culturing cells or tissue from the plant;
- (b) inserting into the genome of the cells or tissue an isolated DNA coding sequence, the nucleic acid sequence of SEQ ID NO: 3 that encodes a polypeptide, the amino acid sequence of which comprises SEQ ID NO: 4 or a ~~functional derivative thereof~~, protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain with a promoter sequence active in the plant to cause expression of said polypeptide at levels which provide an insect or nematode controlling amount of said protein; and
- (c) regenerating resistant whole plants from the cells or tissue.

34. (Previously Added) The method of claim 8, wherein the insects have cysteine proteases that are insensitive to host plant derived cysteine protease inhibitors.

35. (Previously Added) The method of claim 8, wherein the insects are one or more of Colorado potato beetle, corn rootworm, thrips and leafminer.

36. (Previously Added) The method of claim 8, wherein the nematodes are cyst nematodes or root knot nematodes.

37. (Currently Amended) The method of claim 8, wherein ~~at least one of the~~ protein ~~proteins~~ containing at least one type I repeated thyroglobulin domain is human p41 invariant chain fragment or a ~~homologue or functional derivative thereof~~ protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain.

38. (Currently Amended) The method of claim 8, wherein ~~at least one of the~~ protein ~~proteins~~ containing at least one type I repeated thyroglobulin domain is isolated from the sea anemone *Actina equina* and having the amino acid sequence SEQ ID NO: 2 or a ~~functional derivative or a homologue thereof~~ protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain.

39. (Currently Amended) The method of claim 8, wherein ~~at least one of the~~ protein ~~proteins~~ containing at least one type I repeated thyroglobulin domain is a protein isolated from the eggs of chum salmon or a ~~homologue or functional derivative thereof~~ protein that possesses a biological activity that is substantially similar to the biological activity of the protein having the amino acid sequence SEQ ID NO:2 and that contains at least one type I repeated thyroglobulin domain.